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# (54) IMPROVEMENTS IN HEATING APPARATUS FOR MAINTAINING A UNIFORM PERIPHERAL OR SURFACE TEMPERATURE ON A CYLINDER

(71) We, HUNT & MOSCROP LIMITED, of Apex Works, Middleton, County of Lancaster, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in apparatus for maintaining a uniform peripheral or surface temperature on a cylinder for use in the textile, paper and other industries.

A heated roller for conveying and heating filament like products or films in tape form especially of synthetic material preferably for use at speeds at which the centrifugal force at the periphery is greater than the gravitational acceleration 'g' has been proposed in which a heating system and a cavity partly filled with liquid are arranged inside said roller wherein the roller is double walled, the annular gap between these walls containing said liquid and its vapours being hermetically sealed and the inside of the outer wall is provided with projections directed radially inwards into the vapour zone and/or the outside of the inner wall is provided with projections directed radially outwards which projections contact the layer of liquid in contact with the inside of the outer wall under the effect of centrifugal force, a regulator being provided to control the temperature.

According to the invention apparatus for maintaining a uniform peripheral or surface temperature axially of a rotary cylinder comprises an outer rotary hollow closed-end cylinder the periphery of which is to be heated, a second inner coaxial cylinder the annular space between the outer and second cylinder being partially filled with water or liquid from which air has been exhausted to lower the pressure therein and a third coaxial cylinder of less diameter than the second cylinder fluid being circulated through the annular space between the second and third cylinders to transmit heat to the periphery of the second cylinder, the heat being transmitted from the periphery of the second cylinder to vapourize the water or liquid in the annular space between the outer and second cylinders to maintain the uniform temperature along the periphery of the outer cylinder.

The invention will be described with reference to the accompanying drawings:—

Fig. 1 is a side elevation of a rotary heated cylinder;

Fig. 2 is an end elevation of same;

Fig. 3 is a sectional elevation of same to a larger scale.

The apparatus for maintaining a uniform peripheral or surface temperature axially of an outer rotary cylinder 1 comprises a second or inner concentric cylinder 2 and a third concentric cylinder 3 of less diameter than the second cylinder.

The outer cylinder 1 is closed at both ends and the annular space between the cylinders 1, 2 is partially filled with water or other liquid, air being evacuated from the annular space through a vent 4 which is then sealed. On heating the water or other liquid boils at a temperature corresponding to the pressure in the annular space between the cylinders 1, 2.

In order to obtain a uniform temperature on the outer surface of the cylinder 1 the water or other liquid is heated by a fluid heating medium in the annular space between the cylinders 2, 3 which vapourises the liquid in the annular space between the outer cylinder 1 and the cylinder 2 and by controlling the vapour pressure or temperature in the annular space between the cylinders 1, 2 a uniform temperature is maintained around the periphery of the cylinder 1.

A series of baffles 5 or agitating strips may be provided extending radially outwards from the cylinder 2 to cause the liquid and vapour to circulate in the annular space between the cylinders 1, 2 as the cylinder rotates and thereby assist in maintaining the peripheral temperature uniform.

The cylinder 1 is mounted on a shaft 6 extending through end caps (Fig. 2).

The water or other liquid partially filling

[Price 33p]

the annular space between the cylinders 1, 2 is vapourized by heat transmitted to the shell of the cylinder 2 by fluid circulated through the annular space between the cylinders 2, 3.

The water or other liquid in the annular space between the cylinders 1, 2 vapourizes at a temperature corresponding to the boiling temperature thereof at the pressure prevailing in the annular space between the said cylinders.

WHAT WE CLAIM IS:—

1. Apparatus for maintaining a uniform peripheral or surface temperature axially of a rotary cylinder comprising an outer rotary hollow closed end cylinder the periphery of which is to be heated, a second inner coaxial cylinder the annular space between the outer and second cylinders being partially filled with water or liquid from which air has been exhausted to lower the pressure therein and a third coaxial cylinder of less diameter than the second cylinder, fluid being circulated through the annular space between the second and third cylinders to heat the periphery of the second cylinder, the heat being transmitted from the periphery of the second cylinder to maintain the uniform temperature along the periphery of the outer cylinder.

2. Apparatus for maintaining a uniform peripheral or surface temperature of a rotary cylinder as in Claim 1 in which a series of baffles or agitating strips extend radially outwards from the shell of the second cylinder to cause the liquid and vapour to circulate as the outer cylinder rotates.

3. Apparatus for obtaining a uniform peripheral or surface temperature on a rotary cylinder for use in the textile, paper and other industries substantially as described with reference to the accompanying drawings.

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1417991 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

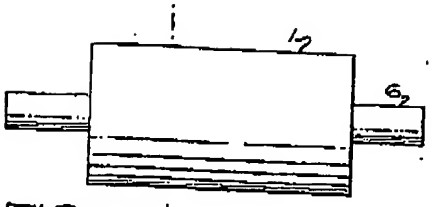


FIG.1

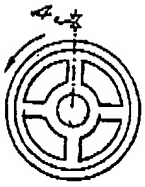


FIG.2

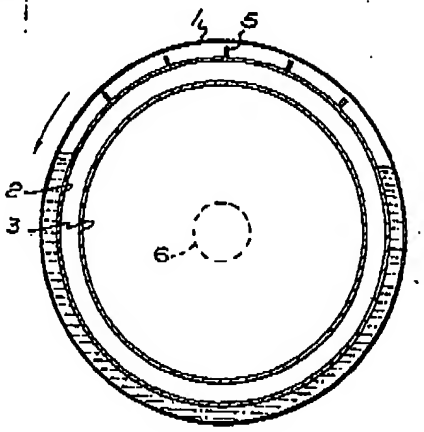


FIG.3